

International Conference on the Management of Naturally Occurring Radioactive Materials (NORM) in Industry

VIRTUAL EVENT

International Conference on
**Management of Naturally
Occurring Radioactive
Material (NORM) in Industry**

19–30 October 2020

#NORM2020



Contribution ID: 253

Type: **Poster**

Phosphogypsum Management in Jordan – Review and Outlook

Phosphate rocks in Jordan contain rare earth elements (REEs) as well as radioactive natural uranium. Both the rare earths naturally occurring radioactive materials (NORM) transfer in certain percentages to the phosphogypsum a by-product in phosphate rock processing to fertilizer using the wet-phosphoric acid (WPA) process. At present the phosphogypsum by-product is stacked near the phosphate rock processing plants and needs to be managed. Phosphogypsum is not only a by-product but can be considered an important resource since the majority (60-80%) of REEs from the phosphate rocks concentrate in the phosphogypsum processing stream while the naturally occurring uranium largely (70-90%) transfers to the phosphoric acid stream. Besides the considerable concentrations of REEs phosphogypsum, still contains relatively large amounts of phosphorus (P), so that it is sometimes used as a fertilizer or soil supplement. Another interesting application is the use of phosphogypsum as a construction material. Phosphogypsum shows characteristics very similar to those of natural gypsum so that it is often considered as a raw material for the cement industry. In this work we review the present phosphogypsum management in Jordan and provide an outlook into future phosphogypsum processing and usage.

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Session Classification: Session VI - Solutions for Residue and Waste Management

Track Classification: NORM Residue and Waste Management